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## HORSE-SHOE BATS.

BY THE EDITOR.

(PLATE I.)

NOTWITHSTANDING the close attention which is now-a-days paid to British Zoology by observers in all parts of the country, the Bats (with two or three exceptions) are still very imperfectly known. Their crepuscular habits, their rapid movements on the wing, and their retired and frequently inaccessible haunts, render them at all times difficult to procure for identification or examination.

In the last edition of Bell's 'British Quadrupeds' (1874) fourteen species are recognised as British, and are placed in five different genera. Of these the two Horse-shoe Bats belonging to the genus *Rhinolophus* are amongst the rarest or least known. The generic characters indicated by Bell are as follows:—

"Incisors  $\frac{2}{4}$ ; molars  $\frac{5-5}{6-6}$ . Nostrils with two foliaceous appendages; the posterior one erect and pointed posteriorly, the anterior one horse-shoe shaped, and expanded over the top of the nose. Ears lateral, free; tragus wanting. Wing-membranes extending only to the distal extremity of the tibia; tail short, enclosed in the membrane."

The use of the singular leaf-like appendage upon the nose has not been satisfactorily determined. Geoffroy supposed it

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was intended to close the nostrils when not in use; Bell regards it as a delicate organ of touch, enabling the owner to avoid collisions when threading its way through intricate places.

Two species of the genus are found in the British Islands, the Greater and the Lesser Horse-shoe Bats, *Rhinolophus ferrum-equinum* and *R. hipposideros*. Both are partial to dark caverns and deserted buildings, shunning the light as much as possible, and flying late in the evening until dark.

On the wing the Greater Horse-shoe Bat appears as large as a Noctule, equalling that species in expanse of wing, but to a practised eye it is distinguishable by the proportionately greater width of the flying membrane. It was first made known as a British species by Latham, who procured specimens in the saltpetre-houses at the powder-mills at Dartford, clinging in a torpid state in winter to the roof. Since then it has been met with and procured in several other localities in the southern and western counties of England, including Dorset, Devon, Cornwall, and Glamorganshire, being considered rare in the midland counties, and altogether unknown in the north. (See 'Zoologist,' 1884, p. 483).

The Lesser Horse-shoe Bat, *R. hipposideros*, which was for some time regarded as a small variety of the larger species, was first recognised in England by Montagu, who procured specimens in Wiltshire, and like its larger congener is chiefly restricted to the southern counties of England.

In Ireland the larger species is unknown, but the smaller one has been found in Galway by Prof. King, and in different parts of Clare by Mr. Foot and Prof. Kinahan. (See Proc. Nat. Hist. Soc., Dublin. vol. ii. p. 152, and 'Zoologist,' 1861, p. 7617). All the caves in which specimens were found (in Clare) were in plantations, or near them, and most of them had the entrances hung with plants. From the observations of Prof. Kinahan it appears that the sexes hibernate apart. The particular respects in which the two species of *Rhinolophus* differ have been pointed out by Bell (*op. cit.* p. 100), and need not therefore be repeated here.

As few really good figures of Bats are accessible, those in Bell's work being almost too small to be of much use, it is very desirable that no opportunity should be lost of obtaining correct drawings of the rarer species whenever they can be procured

alive, or in a fresh condition, so as to secure an accurate delineation of the natural features before they become distorted or shrunk in the process of drying. As a first contribution to such a series, we give a plate of *Rhinolophus ferrum-equinum*, drawn by Mr. G. E. Lodge from a living specimen procured by the Rev. H. A. Macpherson in South Devon in August last.

The measurements, taken after death, from another specimen procured at the same time and place, and now preserved in the Natural History Museum, South Kensington, are (compared with the measurements given by Bell) as under :—

Length of head and body -	2·5 in.	Length of humerus -	1·3 in.
„ tail - - -	1·2 „	„ forearm - - -	1·9 „
„ head - - -	·9 „	„ longest digit -	3·1 „
„ ears - - -	·9 „	„ tibia - - -	·9 „
Width of ear - - -	·5 „	Expanse of wing -	11·5 „

On comparing these measurements with those given by Bell, it should be noted that the latter are given in inches and lines. The expanse of wing is apparently very variable. One procured in Dorchester by Mr. James Salter measured in extent of wing  $14\frac{1}{8}$  inches. The weight of the specimen above referred to from Devonshire was little more than half an ounce the day after death.

## ON THE HABITS AND MIGRATIONS OF WILDFOWL.

BY ALFRED CRAWHALL CHAPMAN.

IN Northumberland the autumnal immigration of fowl commences in July, and is continued throughout the remaining months of the year. Waders generally arrive before the migratory ducks and geese, and it is usually the latter end of September before any of the latter appear upon our coasts.

Wigeon are usually the first to make their appearance, and they are, I think, followed by arrivals of foreign-bred Mallard. Then, about the middle of October, the Scaup and Goldeneye arrive, and at any time after this date the resident winter ducks and divers may be looked for. Teal are of course to be found during the month of August and onwards, but

I have not been able to discriminate between home and foreign-bred Teal, and therefore their date of arrival is not easy to define exactly.

This year (1886) the first flight of Wigeon arrived on the 11th September. This is an earlier date than usual for them, and generally they may not be expected for at least ten days to a fortnight later. This was only a small company, however, and not until Sept. 19th did another small lot of about thirty birds arrive. On October 4th several companies arrived on the coast, and after this date there is a constant increment of Wigeon, until their regular winter numbers are made up. It is generally supposed that Wigeon are night-feeding birds, and that they spend the day at rest in some open extent of water, free from molestation. On this coast, however, when they first arrive their habits are very different from this, and they prefer to feed on the ooze during the daytime, spending the night at rest on some secluded pond or lake. I have come to this conclusion after carefully studying their habits, and I have frequently seen them, after quietly feeding all day, leave the ooze just before dusk, and betake themselves to a neighbouring pond, where they spend the night, returning to the ooze to feed shortly after daybreak. During this period, however, their numbers are woefully reduced by punt-gunners, and by the end of November—by which time mostly all the regular winter stock has arrived—they have assumed the habit of feeding almost exclusively by night, spending the day on the open sea.

It would be interesting to know what course they would pursue if left entirely unmolested. From their habits during the early weeks of their arrival I cannot help thinking that they are forced by man to assume a habit at variance with what appears to be their wont, and the same remarks apply to Grey Geese feeding inland, as I hope to show farther on.

Tidal influences, of course, affect the Wigeon, and there is no doubt that during a short winter's day, when their feeding-grounds are submerged, they would resort at night to the uncovered oozes to feed; but, given the opportunity, they unquestionably avail themselves of a diurnal feed, until they are scared away by the deadly fire of punt-gunners.

Moreover, the flocks that arrive first are composed mostly of young birds of the year, inexperienced to the dangers of an



approaching punt-gun. These are the birds which, feeding by day, suffer most, but as soon as the older birds arrive—though they too, with the young birds, resort at first to day-feeding—it only takes a very short time to put them well on the alert, and after that not a Wigeon will be found on the oozes, channels, or mudflats during daytime, except under the circumstances of exceptional stress of weather, when, weakened and reduced by a state of semi-starvation, they are glad to avail themselves of either diurnal or nocturnal feeds. I am aware that this does not harmonize with much that has been written on the subject, but I can only say that it is what actually takes place in the tidal estuaries of Northumberland.

Though the earliest comers are mostly young birds, yet there are some old ones amongst them, and as early as Sept. 20th I have seen the white speculum in the wings of some Wigeon, a sure sign of maturity.

Wigeon feed on grass, and they can frequently be seen during the day paddling and swimming along the margins of a mudbank, pulling off the salt-grass from its edges.

In the autumn of 1881, a small flight of Wigeon were observed to alight on the ornamental water in Roker Park, in the suburbs of Sunderland. The pond was frozen at the time, and one of the birds (a female) was taken at night in a net. A drake was procured from Norway, and in the summer of 1885 the duck made a nest, laid seven eggs, and hatched out five young.

They are all healthy and flourishing as I write. On July 2nd, 1886, the same old duck was again missing. She had made a nest on the side of one of the artificial channels in the park, and though she laid eight eggs they never hatched. Strange to say, about October 16th ult., another wild female Wigeon joined the original seven, and has remained with them ever since; they are all quite tame. About the same date,—*viz.* the 16th October last,—an immature Goldeneye suddenly appeared on this piece of water; it too has remained ever since, and appears to have taken up its quarters for good. At present it will not actually come close up to one, as the Wigeon do, but swims about and dives unconcernedly within a few paces; nor does it associate with any of the other ducks on the pond, but always remains alone.

Now as to Mallards; an old drake shot September 20th this year did not show a trace of green about his head, and the

plumage generally resembled that of the duck. Another killed on October 22nd was already in his handsome winter plumage, every feather clean and perfect.

This change of plumage is perhaps one of the most extraordinary we have in Nature, and it is well set out in 'The Zoologist' for June last (pp. 228—233). It is said—and I think with perfect right—that Mallards are night-feeding birds, spending the daytime in secluded rest. Though I have frequently met with them during the daytime, sitting both on the salt-slakes and on the banks of streamlets winding through the sandwashes, I never saw them feeding at this time. They are generally sitting all huddled up, their heads stowed away under their scapulars, simply passing the time away until "the sun takes the hill," when they betake themselves to the outlet of some freshwater stream running down from the country into the salt-slakes. Where such a place as this exists Mallards are nearly sure to frequent it at night, and none know this better than the flight-shooters. Many a countryman after his day's work is done shoulders his muzzle-loader, and if the moon is favourable he has a fair chance of getting a shot, aye, and sometimes half a dozen or more shots at Mallards as they come to feed at their favourite stream. Though Mallards have a distinct predilection for freshwater food, yet they do not hesitate to frequent also the saltwater pools and runners left by the ebb.

Pochards are seldom met with on the coast of Northumberland, and are never numerous. On the 22nd October last a duck flew past me when in the punt which I think can have been no other than a Pochard, though this is the only time I have ever come across it, and on the 7th October last one was killed by a local gunner near Ryhope, Co. Durham.

During the month of September, Teal are to be found regularly in the salt-slakes, and it is rather singular what becomes of these birds in the later autumn months. Towards the end of the month of August, and right through September, Teal are perhaps the most numerous of the Duck tribe on the coast. These are probably the birds that have been bred on our upland moors, but after September they generally disappear. Though the difference between home and foreign-bred Mallards is sufficiently palpable, I have never been able to discriminate between home and foreign-bred Teal, and it seems as if the coast of

Northumberland was not particularly well adapted to their habits, as they certainly never appear all through the winter months in anything like large numbers. Little bunches of four or five are occasionally met with, but they are never so numerous as are Wigeon and Mallard. During ten days' shooting in October last I never saw a Teal, while in September I saw them every day. When in company they sometimes keep up a regular chorus as they "chatter" to each other. Six Scaup Ducks arrived on the coast on the 19th October last; previous to this date none had been seen.

I came across six Scaups, probably the same birds, early in the morning of October 23rd. They were very tame, and allowed the punt to come quite near them, when I secured two of them. No. 1 was, from its general appearance, an adult female. The beak was blue, with a black tip; a black line ran along the centre line of the upper mandible, and the edges of the mandibles were also black. The whole of the head and neck was brown, with the exception of the white face extending all round the forehead, and reaching nearly as far as the eyes, which were straw-yellow, as in an adult. The legs and feet were pale blue, with the usual dusky black marks on the joints of the toes. But on close examination faint black bars might be seen, especially about the ear-coverts and lower part of the neck, but these marks were still hardly visible on the crown of the head. The upper back was plain brown, and the breast was a mixture of very light and very dark browns, but the edges of each of the latter feathers were white. The stomach to vent was white. The flanks were brown, but the edges and centres of these feathers were gradually turning a fine silver-brindled grey. The back itself was brown, each feather assuming a brindled grey colour. The primaries were brown, with deep brown shafts; secondaries white, but tipped with black; tertiaries and scapulars a deep bronze colour with a fine sheen, the greater coverts being the same. The tail was brown. Yet this bird on dissection proved a male.

No. 2, which was a female containing five eggs large enough to be detected with the naked eye, weighed 1 lb. 14 oz., and was considerably smaller than the male. Two yellowish white spots were conspicuous in this bird on either side of the head between the beak and the eye, but this lightness of colour (the rest of the head being buff brown) did not join over the upper mandible as

in the male described. Moreover the bill in the female was a dull leaden colour, and the irides were a much darker colour than in the male. The whole of the upper plumage was brown but for the white secondaries, which were tipped with black, and here and there the brindled grey showed itself on the upper part of the back.

Judging from these birds and from other Scaups which I have seen, I believe their changes of plumage, which have been inaccurately described by various writers, to be somewhat as under. Further observation, however, is required to confirm the opinion here expressed.

During their first autumn and winter the young males and females are probably much alike, both having a dusky brown head and neck; but at this period I do not think they show any signs of the white face.

By October, in their second autumn, young males have the brown head, neck, and breast, and a pure white face as in the adult female, but the brown feathers are being rapidly displaced by feathers of a dull sooty black colour. By this period their bills, eyes, and feet have attained the colour of the adult bird, viz., blue, straw-yellow, and dull blue, respectively; thus it appears that the soft parts attain the mature colours before the feathers do. Now, I think that by the end of the year these birds would have assumed a plain black head, but the white face would be retained. By this period the young females are in the state of plumage in which I have described No. 2, with the white face in an embryonic condition.

By October, in the third autumn after they are hatched, I think the young males begin to assume the glossy purple-green head of the adult bird, at the same time gradually losing the white face; but here a doubt perhaps exists as to whether another year would not have to elapse before the bird attained the purple-green head, as Scaups are obtained in winter with plain black heads and without any white face. By their third autumn the females also probably become adult, resembling very closely the state of plumage in which the male is when only sixteen months old.

Briefly, the changes in young males may be as follows:—First autumn, dull buff-brown head and neck; second autumn, white face and brown head, the latter turning sooty black; third



autumn, loses white face, head entirely sooty black; 4th autumn, attains the glossy (adult) head.

These Scaups had been feeding upon sea-grass, which was to be seen in their gizzards, chopped up into pieces about half-an-inch long; fragments of small sea-shells, periwinkles, mussels, &c., were also among the contents of the gizzard, but the crop was quite empty. I believe that sea-diving ducks eat much more grass than is generally supposed.

Though the Scaup is essentially a diving duck, yet when pursued with a broken wing, one of the above birds showed no tendency to dive, and allowed itself to be overtaken in a way at variance with their wont. They are fond of frequenting sea-weed covered rocks, where they can dive for their food.

If you see Scaups busy diving, they are nearly sure to be above some submerged tangle-covered reef, or over some bed of mussels known by the name of "scap" in Northumberland. Such a place is their regular feeding-ground, where they can by diving reach the young mussels adhering to the sea-tangles.

They are also fond of young cockles, small crabs, and the spawn of other molluscs. Scaup, unlike Mallards, are not "flighters;" they have no regular lines of flight to and from their feeding-grounds. During the daytime they may be found frequenting any rocky inlet of the sea, where there is plenty of black seaweed, or about the mouth of some burn running from the slakes proper into the open channels of the tide-way. I am not sure that Scaups ever leave tidal waters, at least in Northumberland, during the winter months, though with advancing spring they do resort to fresh-water loughs inland previous to taking their departure northwards to breed. With the exception of one solitary instance they have never been known to breed in the British Islands. In Northern Iceland they breed in immense numbers in the month of July, and Messrs. Slater and Carter have recently given, both in 'The Ibis' (1886, p. 45) and 'The Zoologist' (1886, p. 149), a most interesting account of the numbers that frequent that district during the breeding-season.

Goldeneyes, unlike Scaups, show a preference to freshwater loughs and rivers during their stay with us, and they are not nearly so often found frequenting tidal waters. They are generally in winter one of the wildest of the duck tribe to approach with a punt, but I must add that on their first arrival

here (before they retreat inland) they are easy birds to approach. In 1886 I observed them first on October 22nd on tidal water. There were only four, and when first seen they were swimming in company with four Red-breasted Mergansers, *Mergus serrator*. When we were yet a long way off, the Mergansers began to leave them, swimming right away from them. Then the Mergansers waited for them to come up. Meantime we were drawing nearer. Again the eight got together, and again the more cautious "Saw-bills" drew away. We were now about fifty yards from the Goldeneyes, but the Mergansers were more than double this distance, and still they evidently thought they were too near by taking wing and thus saving their lives, as is indeed usually their custom. The four Goldeneyes were swimming in open order, and I was anxious to get them together; for this purpose they actually allowed us to chase them about, only swimming away from the punt, but they refused to go close together, nor did they reluctantly take wing till driven into a bight of the sea, a real *cul de sac*, whence escape was possible only by flight. When in company with the Mergansers, their rates of swimming were severely contrasted, the Goldeneyes being invariably left "clean out of the race." On October 27th, another small detachment of five Goldeneyes arrived on the coast; they too were very tame until shot at, when they would not admit of further approach. On setting to them a second time, they resumed their usual wildness, and rose fully 300 yards away from the punt. No instance is known of the Goldeneye staying to breed in the British Islands, though they are regularly seen well into the month of May frequenting freshwater loughs and rivers. (But see More, 'The Ibis,' 1865, p. 447, and R. Gray, 'Birds of the West of Scotland' (1871), p. 395.) I once found the nest of this bird in Russian Finland in latitude 70°, but this is considerably beyond the ordinary limits of their northern breeding haunts.

The trees at this latitude are very small and stunted in growth, far too small, one would think, to afford a nesting hole for so bulky a duck as the Goldeneye. After a long search, however, the nest and six eggs were found in the inside of an old stump, and I believe this is the most northern breeding place of the Goldeneye as yet recorded.

I have never seen Goldeneyes out on the open sea by day, but I have seen them come up the harbour from the sea shortly after

daybreak, so I presume they spend the night, when on the coast, out on the open sea, just as Brent Geese and Mergansers do.

The crop of a young male Goldeneye, shot October 22nd, about 2 p.m., was empty, but the gizzard was packed full of sharp gritty sand, with rather large quartz pebbles. I have often seen the bill of a Goldeneye, after coming up from a dive, full of bottom refuse; this he lays on the water, and eats at leisure, after the manner of a surface-feeding duck.

Mergansers are, I think, by far the fastest swimming ducks we have; low in the water, with neck erect, they can quite outwit a gunning punt, and seldom indeed do they allow approach within fair range. When undisturbed, they frequently land on the sides of the sandbanks, and when ashore they stand nearly erect. I remember once, when at Bodö, in Nordland, getting quite close to a Merganser sitting nearly bolt upright on a small rock protruding from the deep water, and during the winter time they can often be seen thus standing along the sides of the tidal channels. When alarmed, they waddle quickly down to the water, or fly direct from the ground. Mergansers never stay inside the harbour by night: about dusk they all, to a bird, leave the channel where they have been busy feeding all day, and resort to the open sea for the night. One bird, shot thus going out at night, was crammed full of tiny plaice, which they catch about the sandy-bottomed channels which they frequent. When feeding they allow themselves to drive up with the flood perhaps a quarter or half a mile, when they all rise, and, flying back to their original starting-place, recommence their raids on the finny ones. With the first of the light in the morning they return from the sea to the harbour channels to feed.

About thirty of these birds arrived on our coast on October 20th, and I saw them all file out to sea about four o'clock in the afternoon. Their flight, like their natatory powers, is very rapid, and they usually move in a long thin line when on the wing in company. A winged Merganser is generally a lost one. The local name for it is "Yawol."

The Goosander, *Mergus merganser*, a far heavier and more bulky bird, is seldom found on the coast, unless driven by hard weather from his inland haunts, but the Merganser is essentially marine in its winter habits, and I think never during the winter season resorts to fresh-water lakes or streams inland, though

with approaching spring they at once betake themselves to fresh as well as salt-water loughs to breed. They have never been known to breed in England, though in Scotland, and all along the Scandinavian Peninsula, they nest freely. Their food, of course, consists of fish, for securing and holding which their saw-bills are most admirably adapted.

Off the Northumberland coast, the sea ducks proper are the Common and Velvet Scoters (though the latter is rather scarce), the Long-tailed Duck, the Eider, and the Shellduck.

Sea ducks obtain at least a great part of their food by diving, and in general this consists of the soft bodies of molluscs. That they will avail themselves, however, of other food when occasion offers is certain, and the following was narrated to me by a fisherman in whose observation I can place implicit faith:—About thirty-five years ago, a sailing vessel, "The Falcon," loaded with grain, was wrecked off Holy Island in September. At first about a dozen Scoters frequented the scene, feeding on the grain, but afterwards many hundreds of these birds, as well as Long-tailed Ducks, were daily to be seen greedily devouring the floating grain as it was washed out of the ship.

The same man also told me how one night in the first or second week of September, twenty-five years ago,—a dark night it was, with drizzling rain,—a bird deliberately flung itself upon the burning coals of the stove in the coble where they were warming their coffee, and that he quickly picked it out of the fire to prevent it being burnt. The bird was a Storm Petrel (*Procellaria pelagica*), and he kept it alive for several days, till it ended its misfortunes by being eaten by his cat.

This man also told me how two birds hovered round the fishing-boat one day, which, from his description, can have been no other than Fulmar Petrels. Both of these Petrels occur irregularly on the Northumberland coast.

Though not a regular gunner, it will be seen that my informant is an observant man. When crossing along the edge of the ooze, he one day pointed to a bank a few yards above high-water mark, at the same time remarking that "it was on that very bank where he once saw, during the month of March, several hundred 'Ware Geese' sitting, and that this was the only instance during his lifetime that he had known these geese to alight above the "full sea-mark." Generally speaking,



Brent Geese never alight above high-water mark during the period they are on our shores during winter.

The Eider, or, as he is locally termed "Culver" duck, is perhaps the most characteristic sea duck we have in Northumberland. He is with us all the year round, breeding freely on the Farne Islands, and sparsely on the mainland. On October 27th, this year, I observed a most extraordinary feat performed by Eiders. Four of them, all dark-coloured young birds of the year, were feeding along the edges of a basaltic reef thickly overgrown with sea-tangles, and here they were working havoc among the dog-crabs and other small shell-fish. We ran down on them, thinking they might be Scaups. When within gunshot they rose, and, being in a narrow bight of the sea, they had to head round, so as to pass us broadside on within twenty yards. I fired at the leading bird, and, to my surprise, all four went headlong into the sea from a height of perhaps twenty feet. At first, I wondered, could I have killed them all with the one shot? Presently one bird came up dead, but the other three had dived from the wing on the instant they perceived the real danger, nor did they come up again till well out of shot, when they immediately took wing and escaped!

The Sheldrake (*Tadorna vulpanser*) is resident in Northumberland, breeding on the sandlinks along the coast. They frequent the slakes, sandbanks, and mud-flats, as well as the open sea. During August the old duck brings her brood into the harbour, and if pursued they dive freely, but as soon as the young are full-grown they always take wing when pursued, in preference to diving. Yarrell states that the legs of the young bird in August are "flesh-colour": all I have seen at that season of the year have been lead-coloured.

In 1886, up to October 27th, I had seen no Long-tailed Ducks (*Hiarelda glacialis*), though by this date they may be expected to appear. They are essentially sea-ducks, and, I think, never come inside the harbour either by night or by day. In very rough weather Common Scoters (*Edemia nigra*) will sometimes venture inside, but this is unusual, and their regular haunts are the open sea, just to seaward of the foreshore breakers.

I have never seen either the Pintail (*Dafila acuta*) or the Tufted duck (*Fuligula cristata*), on the coast, but the Shoveller

(*Spatula clypeata*) occurs regularly during summer, and breeds on an inland pond in company with Mallards, Teal, Coots, Waterhens and Dabchicks. I think Shovellers, at least in Northumberland, seldom come into the slakes; on no occasion have I ever seen them there; probably they migrate direct from their breeding-places southwards. The only one I ever shot was on August 12th, 1877.

Of all the wildfowl visiting the coast of Northumberland, "Grey Geese" are, to the punt-gunner, the most difficult to negotiate. Feeding as they do during the daytime on grain-stubbles, they are then beyond the fowler's reach, unless, indeed, he has the right to follow them.

It was on the 16th September last that I shot the Lesser White-fronted Goose (*Anser albifrons minutus*; *Anser erythropus*, Linn), as elsewhere recorded ('The Field,' December 11th, 1886, p. 872); but the migratory hosts of the ordinary Grey Geese did not arrive until October 12th, nearly a month later, which is about their usual date. A special feature in connection with these Grey Geese was the extraordinary numbers in which they invaded our shores last autumn. Never previously, so far as I know, have such numbers been seen here. On the evening of October 14th I went to a place where I thought a shot might be had at them. About 5.15 p.m. I was greatly surprised to see a large flock rise off the open sand wastes where they generally spend the night, and, with a great "gag-gling," wing their way inland. After manœuvring some ten minutes, during which time they did not maintain their regular V-shaped formation, but flew in loose order, they all went down into a barley-stubble, when they made a great noise; then all was silent. The moon was rising at the time, and a herdsman who happened to be passing that way put them up again off the stubble. It was then too dark to see them, but I heard them flying and gagging about the fields for an hour afterwards, when I left them quietly feeding by night. At first this conduct seemed most strange, but reflection soon showed that it was only as it should be. At this time of the year, when, owing to the inhospitable nature of our climate, the farmer has been unable to get his cereals gathered and led from the fields, it is obviously impossible for the Grey Geese to get their diurnal feed, owing to the number of labourers working in the fields where they

want to feed, and consequently they have to wait till the fields are left quiet and undisturbed.

On October 14th it was 5 p.m. when the harvesters left the fields, and it was 5.15 (as above stated) when the geese, which had been sitting about a mile off on an open stretch of sand, rose to go into the fields. The geese at this season alight among the stooks, where they can feed at leisure, without having the trouble of walking about to look for the grain. That they will return, however, to their more regular habit of feeding by day on the very first opportunity was fully demonstrated to me, for on October 16th, when it was so stormy that the farm labourers could not work in the fields, I saw fully two hundred geese busily engaged in feeding on the stubbles, about ten o'clock in the morning, and this in the very field where but two days ago they were feeding at night. Again on October 21st I saw about five hundred geese sitting on the sands. They were very restless, and would not allow the punt to approach them. Every now and then they would rise in a body and betake themselves inland. Here, however, they found the fields frequented by workpeople, and after gyrating in the open air at a great height for a few minutes, they would return to the sands from whence they had risen.

During the three days succeeding this date they were regularly to be found sitting on the open sands during the day, waiting for the fields to be cleared, when they might feed unmolested by night. By October 25th the stooks had been got in, and the stubbles were left unfrequented by man. The geese at once assumed their normal habits, feeding all day, and half an hour before dark any night their extraordinary, V-shaped formation might be seen heading direct for their favourite resting-places. Their formation when on the wing is more mechanically true than is the case with Brent Geese, and the incessant gagging which they make on going to and from their feeding grounds is audible at an immense distance. Many a flight-shooter has endeavoured to waylay these wary birds as they come to the sands at night, but with very indifferent success. I believe nine nights out of ten they do not even get a shot.

On October 23rd I all but succeeded in getting a good shot at them. The position was peculiar. An isthmus of sand 180 yards wide separates the north sea from the harbour waters. At a point in this isthmus is an opening or channel, some 50 yards

wide, deep and dangerous for a punt. This channel is the sluiceway for part of the harbour water direct into the breakers of the North Sea, and down it or up it, according as the tide is ebbing or flowing, the water runs like a millrace. Between 500 and 600 Grey Geese were sitting along the seaside of the isthmus on either side of the outlet channel. The punt was lying at the opposite end of the channel, *i. e.*, on the harbour side, and exactly 180 yards from the geese. The only means of a nearer approach was down the channel with the ebb, or, as my puntsman quietly remarked, "To perdition in ten feet of water among the breakers." There sat the geese, all unconscious of our presence. Everything about them was as clear as daylight through the binoculars, with this exception—I could not identify the colour of the nail on the beak; and so, alas! they remain unidentified to this day.

Before putting the birds up, we gave them gentle cause for alarm, and it was maddening to see how they separated into companies, each company so concentrating itself in its fear, that if only I could have come within range, a heavy shot must have been the result. On walking over the place where they had been sitting, it was evident that many were moulting their quills, as these feathers lay about all over.

During October and November these geese remain with us, and indeed as long as good stubble food is to be found. As soon, however, as the plough begins its work, and their feeding-grounds are destroyed, they rapidly increase in numbers, and before Christmas there are very few left, perhaps a dozen or two. About February and March they reappear in all their strength, making daily raids on the hard corn till their appointed time of departure in April to breed.

Grey Geese very seldom alight on the ooze. On the one occasion when I am told they did so, they paid a heavy penalty for their rashness.

Judging from Grey Geese shot by old gunners, and from what has been written on the subject, it would seem that most of the birds visiting us in autumn belong to the Pink-footed and Bean species. When, however, it is remembered that they disappear in winter almost entirely, I can see no valid objection to their being real Grey-lags, *Anser feras*. The latter breed numerous on the Scandinavian seaboard (as well as sparsely in



Sutherlandshire and in the Hebrides). They do not remain during the winter in Norway, and why should the birds we have here during October and November not be the Norsk-bred Greylags resting in their passage southwards? From what I have seen of them I am inclined to think that this is the case.

They look enormous birds as they stand on the flat sands, and this is not in accordance with their being *A. brachyrhynchus*, the latter being much smaller birds. That they are not the White-fronted species, *A. albifrons*, I am sure, or I should certainly have identified them with the glass. Possibly they may be Bean Geese, *A. segetum*.

Though Brent Geese invariably frequent certain parts of the Northumberland coast during the winter months, the Bernicle, *Bernicla leucopsis*, very seldom does so. This year, on September 23rd, six Bernicles appeared in the slakes at Holy Island, probably on passage to their more regular haunts on the Solway. The islanders assert positively that none had been seen for fully thirty years previously. One of the six was wounded by a local gunner, but never bagged.

I have already remarked that in 1886 Wigeon arrived on September 11th; it was September 16th when the Lesser White-fronted Goose appeared. Both of these dates are unusually early for these birds, yet on September 17th I was even more surprised to witness the arrival of the Brent Goose in the slakes. This was a single bird, and not until October 18th did another occur, when four made their appearance, staying for a day or two, and again entirely disappearing. Small detachments keep arriving during November and December, by the end of which month perhaps a hundred or two may have assembled. During January and February this number is increased to perhaps a thousand or two, and this is the winter stock in mild weather. When, however, by stress of weather in the Baltic and other northern waters, the geese are compelled to retreat before the cold to more congenial shores, then the regular stock is increased, aye, tenfold! This is the time for the wildfowler afloat!

The Brent obtained by me on September 17th was an old bird in poor condition. The features in the plumage were pale yellow feathers at intervals among the ordinary slate-blue feathers of the back, giving the bird a splashed appearance, and, on examination, small brown feathers were visible among the sooty

black feathers of the neck; otherwise he was in the ordinary winter dress of the old bird. We saw him arrive flying direct westwards, but once inside the harbour he alit on a sandbank. Here he amused himself by making short quick runs on tip-toe, flapping his wings the while, till he received his *coup de grace*.

Brent Geese are day-feeders. Only when harassed by shooters do they venture on the *Zostera* banks by night, and this only when they are favoured by moonlight. With the first of the dawn, they rise from their resting-places on the open sea, preparatory to winging their way to their favourite feeding grounds. The sea-grass on which they feed attains a great length, some stalks measuring five feet in length. It is the decomposition of each year's growth that causes the immense deposit of soft mud known as the "slake," incapable in many places of bearing much more than the weight of the birds which feed on and about it. About sunrise, a little sooner or later, according to the tide, the Brents repair to this slimy ooze to feed. During the daytime, especially in fine weather, they may be frequently seen chasing each other, and playing the hours away till an hour or so before dark, when they are again hungry and wishful to get a good crop-full before taking flight seawards for the night. At this time, especially if it be a flood tide and hard weather, the punt gunner expects to get a heavy shot. Indeed, sometimes so intent are they about their own suppers that they will allow a punt to be shoved right up among them. Just as the sun disappears behind Old Cheviot's Firehills, the geese cease to feed, and go direct out to sea. With the exception of crossing a narrow strip of sandlinks both at their morning and evening flight, they never cross dry land, and their flights are usually made at a height beyond the reach of a shoulder gun; but under the conditions of a head wind, which makes them fly low, usually some gaps are made in their otherwise beautifully symmetrical formations.

A winged Brent is pretty sure to make for the water if it happens to fall on dry land. Here they make feeble attempts at diving, but on the whole cripples are usually easy enough to gather.

During October, and especially from the 20th to the 25th of the month, Redwings and Fieldfares were nearly always to be heard passing over westwards while we were busy launching the

punt in the early hours before daybreak. Snow Buntings and Sky Larks were also to be heard, and on October 15th, during a severe gale from the south-east, I frequently put up Redwings from amongst the black rocks, evidently birds newly arrived.

This feature of migration is, however, so regular and so certain in its annual recurrence, that it is doubtful if further observation will much increase our knowledge of the subject. Some birds, however, are very irregular in their immigrations. On October 18th and 20th ult., two specimens of the Great Spotted Woodpecker occurred at a point on the Northumberland coast, which only confirms the observations of others that these birds are immigrants to our shores. There was hardly a tree in the neighbourhood where they were, and one bird which flew off the ground alighted on a gate-post for want of a better perching place. In 'The Field' for October 30th ult., an instance is cited of the occurrence of this bird in Co. Down, Ireland, and, though the exact date is not given, it seems to coincide with my own observations. Probably there was a "rush" of them about October 20th, at which time the weather here was thick and foggy, though for several days previously a severe storm had raged from the east and south-east.

On October 15th thirty Swans were reported as having been seen by some fishermen when following their calling about seven miles out at sea, though nothing more was seen or heard of them. They were said to be flying westward at the time. These birds occur nearly every winter in Northumberland, and when they are seen to alight they are usually obtained. My brother (H.) shot a fine young Whooper, one of a pair, in January, 1881. Weight  $17\frac{1}{2}$  lbs.

During the month of October enormous numbers of Peewits come to rest on the oozes during the day. Golden Plovers are also present, but in smaller numbers. Two shots fired at them produced twenty-nine Peewits, two Golden, and four Redshanks. I say "rest" advisedly, for I have watched them for hours, with perhaps a score of birds within ten yards of the punt, every bird sitting abreast to windward and head tucked away in the back feathers, sound asleep. So peaceful do they appear that they allow the approaching flood to creep gently round them. Half-inch by half-inch it gradually rises, till the Plovers actually seem to be swimming in the water. When breast-deep they wake up,

and, with a little scream of "ennui," fly perhaps fifty yards landwards, when they again go to sleep. I know of no prettier sight than to see a large flock of Peewits thus whiling away the daytime. About dusk they resort to the turnip and other fields inland, where they feed all night.

During the month of September the slakes swarmed with Oystercatchers, and I hardly saw any Peewits. In October exactly the reverse was the case, and I was at a loss to know where all the "sea piots" had got to. I imagine the great flocks of Peewits were mostly immigrants, though outwardly no proof of this was apparent. Most of those shot were young of the year. During November, however, there were great numbers of both Peewits and Oystercatchers.

A prominent feature in the slakes during October is the absence of the Lesser Black-backed Gull; in September they were numerous, but now their place is taken by their big brother, *L. marinus*. Often, when setting to fowl, this large Gull comes sailing straight at you, and with his loud "hau-hau-hau" he raises the slakes. In an instant, some Curlew, who had been brooding what that *strange white line* on the water might be, takes the warning, and, by his fearful vociferations, he usually succeeds in spoiling the punter's chance of a shot.

The *Columbidæ* are all represented on the Northumberland coast during winter. Though two of the three species breed in Scotland and in the Hebrides, they do not arrive here any sooner than the foreign-bred Wigeon, and often considerably later. Up to the end of October I noticed very few, but after that date their numbers increased till about the end of the year.

Mr. Cullingford tells me that he had a Red-throated Diver from Lewis (Oct. 29th, 1886) with a perfectly red throat. He also had a Black-throated Diver from Lincolnshire (Dec. 24th, 1885) with the new black throat already perfectly developed, and the general plumage, checkered back, &c., was equally advanced. It frequently happens that birds shot in March and April do not show nearly so much summer dress as in the above examples. The Red-throat is always much the commonest of the three Divers on our coast, the Black-throat being the rarest. At daybreak there is a regular flight of Divers from the sea, where they spend the night, into the tidal channels of the harbour. Divers, unlike Mergansers, do



not feed in company, and, though two or three may be seen together, they are usually solitary.

Grebes resemble divers in their habits when on the coast. The Slavonian (*P. cornutus*) is the commonest Grebe we have during winter, but the Eared, *P. auritus*, and Great Crested Grebe, *P. cristatus*, occur, the latter being the commoner of the two. I noticed one of the latter birds on October 22nd. The Red-necked Grebe, *P. rubricollis*, occurs, but I have never shot it.

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## ON THE BREEDING OF ARCTIC BIRDS IN SCOTLAND.

BY HENRY SEEBOHM.

IN 'The Zoologist' for August last my friend and travelling companion, Mr. Harvie Brown, placed beyond doubt the long-suspected fact that the Snow Bunting, *Emberiza nivalis*, breeds in Scotland. No one knows better than he does the significance of this statement. It is not known that any bird breeds farther north than this species. Major Feilden found a nest in Grinnell Land above lat.  $82\frac{1}{2}^{\circ}$ . When I was in Lapland with Mr. Collett we saw nothing of it until we reached lat.  $70^{\circ}$ . It passes through Archangel every spring and autumn, but retires farther north to the extremity of the Karim Peninsula to breed. In the valleys of the Petchora and the Yenesay thousands crossed the arctic circle in spring, but we saw them no more until in the former locality we reached lat.  $68^{\circ}$ , and in the latter lat.  $71\frac{1}{2}^{\circ}$ . The Snow Bunting is during the breeding season an exclusively arctic bird.

The Ptarmigan, *Tetrao mutus*, is quite as arctic a bird, though perhaps not so exclusively so. No arctic traveller has ever reached a latitude too high for this species to be found, and wherever it occurs south of the arctic circle it frequents the mountain tops where an arctic climate is to be found. In Scotland it comes down to 2000 feet, but in South Siberia and Japan only to 6000 or even 9000 feet. The only locality where it is found at a low level south of the arctic circle is on the Kurile Islands, a fact the significance of which will shortly appear.

The Red-necked Phalarope, *Phalaropus hyperboreus*, is another arctic species which breeds in Scotland. In Europe

and Asia it seldom breeds below the arctic circle, except at high elevations: Archangel seems to be too far south to suit its requirements; but curiously enough, on the shores of the Sea of Ochotsk, Middendorff found it breeding as far south as lat. 55°.

The Whimbrel, *Numenius phæopus*, is also an exclusively arctic species during the breeding season, Iceland and the islands between it and Scotland (where it also breeds in the most northerly counties), and probably Kamtschatka, being the only localities south of the arctic circle which it frequents in summer.

The Greenshank, *Totanus glottis*, is another arctic species, though it does not breed so far north as the other birds above named. In Scotland it breeds much farther south than on any part of the Continent, a statement which probably applies to many other species.

If time and space permitted it would be interesting to compare the breeding range in the British Islands of many other arctic or subarctic birds with their breeding range on the Continent. The Great Skua, *Stercorarius catarrhactes*, Richardson's Skua, *S. richardsoni*, the Black-throated Diver, *Colymbus arcticus*, the Fulmar Petrel, *Fulmarus glacialis*, and several species of Ducks, all come under the category of arctic birds which breed at exceptionally low latitudes in Scotland.

Now it is a remarkable fact that not one of these birds breeds either in England or Ireland; and the only conclusion that we can arrive at is that, from an ornithological point of view, Scotland belongs to the Arctic Regions! But like most other remarkable facts it admits of an easy explanation.

This explanation is climatic. Most, if not all, of the species named breed in July. A reference to a map on which the isothermal lines for July are traced will be found to explain all these apparent anomalies in a most remarkable manner. In Keith Johnston's 'Physical Atlas' there is a map of the world in which the mean temperature for the month of July is given in various parts of the earth.

Roughly speaking, the birds under consideration draw the line a few degrees below 60° Fahrenheit. For some special reason they do not breed in any locality where the mean temperature for the month of July is as high as 60°, their reason

probably having relation to the supply of food. In the map alluded to the isothermal line of  $59^{\circ}$  is drawn. It separates England and Ireland from Scotland, passes north of the Gulf of Bothnia, through the town of Archangel, extends nearly straight across Russia and Western Siberia, but east of the valley of the Yenesay again rises until it almost reaches the coast near the delta of the Lena. Farther east in Siberia it plunges south again, much more rapidly than it rose in Western Europe, and passing south of Kamtschatka it embraces the Kurile Islands in the latitude of the Pyrenees.

This line is almost exactly parallel with what we know of the southern breeding ranges of the various arctic birds which have been alluded to, thus conclusively proving that Scotland not only seems to be, but actually is, within the Arctic Regions during the month of July. There is therefore no reason for attempting to explain by any other causes than the ascertained climatic cause the interesting fact that British ornithologists are able to study the breeding habits of so many birds which their continental fellow students can only observe by travelling five hundred miles or more farther north.

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## NOTES AND QUERIES.

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**The Essex Field Club.**—It is announced that the 'Transactions' and 'Proceedings' of the Essex Field Club are henceforth to appear in the form of a monthly periodical entitled 'The Essex Naturalist.' This new departure in the policy of local Societies has been adopted from a conviction that if local Societies are to flourish and do useful work it is necessary to devise some means of "keeping touch" with their members, and encouraging inter-communication among them. We understand that the first number of the 'Essex Naturalist' will appear in January, and will be conducted by Mr. W. Cole, who has edited the publications of the Club since its establishment seven years ago.

### MAMMALIA.

**The Fur Trade of London.**—London is the great market for furs and skins of the world, and not St. Petersburg or Nijni-Novgorod, or any of the great cities of Northern or Western Europe, or Canada, as many imagine. To our metropolis come the fur merchants of every part of Europe, Asia, and

America, to purchase the finest and rarest skins. March and September are now the principal periods of their biennial visitation, and during these months the greatest activity is displayed in the neighbourhood of St. Mary Axe, where from time immemorial the Guild of Skinners have transacted their business. The following statistics will give some idea of the importance of this industry:—In March, 1886, the Hudson's Bay Company submitted to public auction no less than 10,841 Otter-skins; 4,022 Fisher-skins; 855 Silver Fox-skins, of a value of from £10 to £80 each; 3,173 Cross Fox-skins, ranging up to £8 in value; 1,400 Fox-skins, various; 5,200 Lynx-skins; 78,856 Marten, or Sable-skins; 76,374 Beaver-skins; and vast quantities of inferior quality skins. Also, in the same month, at an important sale ("Lampson's"), 1,020 Silver Fox; 7,449 Sables (Russian); 400 Blue Fox; 3,741 Cross Fox; 4,252 Sea Otter, from £8 to £140 value per skin; 7,000 Bear; 3,000 Fishers; 6,559 Otter; 5,000 Fox; 41,387 Marten (H. B. Sable); 250,000 Skunk; 253,000 Raccoon; and 150,000 Mink-skins were sold. The furs and skins are always sold at auction *in lots*. Those who are not acquainted with the system by which they are disposed of would be as interested as astonished if they spent an hour in one of the sale-rooms during the progress of a great sale. Each lot submitted often represents in value hundreds of pounds sterling, notwithstanding which there is seldom a word heard beyond those of the broker giving out the number of the lot and repeating the amount of the bids, the whole business being conducted in such a quiet and orderly manner that a stranger would scarcely imagine such valuable goods were changing hands. The crowd surrounding the auctioneer is a motley one, Russians, Germans, Poles, and French being the largest buyers, and naturally amongst these there is a preponderance of the Hebraic element. Of course the skins and furs have been on view for some days previous to the sale, and as they are generally in a raw state, with the pelt outside, there is merely the fringe to guide the purchaser. It therefore requires great judgment to discriminate their values, but the delicacy of touch of the really genuine merchant is such that he seldom makes a mistake. No skins, however, are seen in the auction rooms, but only at the warehouses, where they are on view some days before the sale.

**Habits of the Weasel.**—Apropos of the enquiry whether Stoats and Weasels kill Moles (Zool. 1886, p. 456), I would now ask do Weasels kill each other? A short time ago my brothers, when golfing on the Leven and Lundin Links, near Windygates, Fife, noticed a Weasel come out of the rough bents at the side of the golfing course, carrying something large in its mouth. It came along at a smart canter, with its head held high,—like a small retriever carrying a large hare,—its burden balanced across its jaws. My brothers gave chase, and, not without difficulty, forced it to drop its load to save its own life, when to their astonishment they found the



Weasel had been carrying the body of another full-grown Weasel! The question is, had the one Weasel killed the other, and was it carrying it off to eat it, or was it a case of a faithful mate or friend bearing off the dead for burial? I should add that there were no marks on the dead Weasel to indicate that it had died a violent death.—CHARLES COOK (Windygates, Fife).

## BIRDS.

**Ruddy Sheldrake in Ireland.**—Having made enquiries about three separate captures of this species in June and July last, I beg to offer the following particulars. Mr. Robert Twiss, who killed two on the Shannon on the 16th June, writes:—"The two Ruddy Sheldrakes which I shot were male and female. When I first saw them they were feeding on a sandy beach. I sent my man in a boat to drive them over to me, but they got up wild and flew down the Shannon over half a mile, and pitched on a strand at the mouth of Cool River, where it empties itself into the Shannon. They only remained there for a few seconds, when they got up again and flew at least two miles down the river, and I sent my man after them. He succeeded in turning them back to me, and when they settled on the stream I got behind some bushes and stalked them. I am sure they could not have been escaped birds, for they were so very wary." Mr. Twiss adds that William Goggin, a farmer, who lives near O'Brien's Bridge, has now preserved in his possession two Egyptian Geese, male and female, which he shot about nine years ago on the same part of the Shannon. The second occurrence of Ruddy Sheldrakes is reported by Mr. Rohu, bird and animal preserver, Cork, who states that on the 26th June Mr. P. O'Connell wounded one of these birds out of a flock of six on the sea, at Bullen's Bay, near the Old Head of Kinsale. He recovered it a few days later on a bog near the sea, and it was sent to Mr. Rohu for preservation. The third capture above referred to was made by the keeper of Mr. Stephen Greehan, of Clonmeen Banteer, in an inland and northern part of the Co. Cork, between thirty-five and forty miles in a direct line from the Old Head of Kinsale. About this specimen Mr. Greehan writes:—"My keeper shot it about July 16th (as near as I can recollect), as three of them rose out of a small pond in the middle of a field about a quarter of a mile from the river (Blackwater?). They got up like ordinary Wild Ducks, and all appeared to be alike." I inspected this bird (a male in fine plumage) and the female shot near Kinsale, both of which appeared to be adults, and could see no traces of confinement. The ends of the primaries in each were a little worn, but this was only the result of natural wear, none of the feathers being at all broken or dragged. Even assuming that the birds met with near Clonmeen belonged to the Kinsale flock, which is by no means proved, we have still two distinct captures of this species at points so far apart as Kinsale and the Shannon near Lough Derg. The season was certainly one at

which we should rather expect ducks to be breeding, not migrating, and too early for the flight of birds of the year. Against the theory of their being all "escapes," I may point to the general absence in Ireland of a taste for keeping rare waterfowl. If, however, any large number of Ruddy Sheldrakes are known to have escaped last summer from any private water I hope this notice will elicit a statement of the circumstances.—R. J. USSHER Cappagh, Co. Waterford).

[A letter from Mr. Rohu, for which we are obliged, confirms the account above given of the two specimens forwarded to him for preservation by Mr. O'Connell and Mr. Greehan.—ED.]

**Little Gull in Co. Durham.**—In reference to the editorial comment on my note of the occurrence of this species in Co. Durham (Zool. 1886, p. 457), I write to say the bird is certainly a Little Gull, *Larus minutus*, in first plumage, and not a Sabine's Gull, as suggested. The statements of dimensions, which I gave, are, I think, sufficient to prove this, the length of Sabine's Gull being given in "Yarrell" as 13 inches, while that of the present bird was but 9½ inches—a considerable difference. I can hardly agree with the Editor's statement that the tail of the Little Gull is *square* at the extremity. [It is so stated in the 4th edition of "Yarrell," vol. iii. p. 592, as well as in Seebohm's 'British Birds,' vol. iii. p. 297.—ED.] An examination of a number of specimens shows that in the immature stage it is nearly always distinctly forked,—as much so as, say, that of a Grey-hen,—though not so markedly forked as in Sabine's Gull. Even in adult specimens of *L. minutus*, when the tail-feathers are not abraded, it is slightly forked. The feature is interesting, not only as forming a connecting link with the Terns, but perhaps also as pointing to a common ancestry of both groups.—ABEL CHAPMAN (Roker, Sunderland).

**Montagu's Harrier in Notts.**—It is with regret that I record the slaughter of this rare bird in June last at Boughton in Nottinghamshire; an immature male, just beginning to assume the slate-coloured back. A careful comparison of the wings of this bird with those of the Hen Harrier placed its identity beyond a doubt. The contents of the stomach consisted of the remains of larks' eggs in various stages of incubation; perhaps also, from their resemblance, there may have been some 'Tree Pipits' amongst them.—W. BECHER (Wellow, Newark-on-Trent).

[These "hunting-hawks," as they are called in some parts of the country, from their habit of flying low and quartering their ground like pointers or setters, are now more frequently met with in England during the autumn months. In October last another Montagu's Harrier was shot near Hastings, as recorded in the present number by Mr. Theobald. A Hen Harrier, *Circus cyaneus*, was shot by one of Lord Scarsdale's keepers on the moors at Wild Boar Clough, near Macclesfield, early in

November last; and on the 30th of the same month a Marsh Harrier, *Circus æruginosus*, was killed in a marsh near Christchurch, Hants. Montagu's Harrier is perhaps nowadays the commonest of the three species in England. A most interesting account of the breeding of the Hen Harrier in Lincolnshire sixty years ago will be found in 'The Field' of the 4th December last.—ED.]

**Blackcap in Co. Waterford in December.**—On Dec. 5th, 1886, as I was strolling through a fir plantation here, I saw to my amazement a male Blackcap fly up and perch within a few yards of me. I had a good stare at him, for he was not particularly shy. There was no mistaking the species; top of head jet black, mantle slaty, under parts pale grey. He busied himself searching the branches of the Scotch firs. The season has been very mild hitherto, without any frost worth mentioning. On December 18th, 1856, I found a male Blackcap, recently dead, here, and a pair bred in 1885, near Clashmore (Zool. 1885, p. 261). These are the only instances in which I have undoubtedly met with Blackcaps here, though they seem to be regular visitants in small numbers to Co. Wicklow, which is nearer to the sources of immigration. How striking is the abundance in this part of Ireland of the Whitethroat, the Sedge and Willow Warblers and Chiffchaff, especially of the last, as contrasted with the absence of so many other insect-finding summer migrants, as the Whinchat, Redstart, Garden Warbler, Lesser Whitethroat, Reed and Wood Warblers, Ray's Wagtail, and Tree Pipit, which I have never met with! How these arbitrary distinctions of breeding-range among kindred species show that migration is an inherited habit!—R. J. USSHER (Cappagh, Co. Waterford).

**Storm Petrel in London.**—At the last meeting of the Linnean Society, held at Burlington House on December 16th, a Storm Petrel was exhibited, which had been picked up on Dec. 9th in an exhausted state near the Serpentine in Kensington Gardens. Its appearance so far from the sea is doubtless to be accounted for by the very tempestuous weather which prevailed about that date.—J. E. HARTING.

**Red-throated Diver breeding in Co. Donegal.**—Mr H. M. Wallis concludes his notice of the Tree Sparrow at Aranmore (Zool. 1886, p. 489) by the following allusion to this much more interesting species, which cannot, like the Tree Sparrow, be of recent introduction. He says, "I found the Red-throated Diver breeding on the mainland (Co. Donegal), but this I think you recorded last year." It appeared from the notice referred to (Zool. 1885, p. 348) that Mr. Lloyd Patterson received from Co. Donegal eggs which were identified as those of the Red-throated Diver, the first evidence recorded of the species breeding in Ireland. As Mr. Wallis is able to offer fresh information on the subject, I trust he will favour the readers of 'The

Zoologist' with all the circumstances, and state whether he found the eggs or young birds.—R. J. USSHER (Cappagh, Co. Waterford).

**Phalaropes, Fulmar Petrel, and Montagu's Harrier near Hastings.**—After the stormy weather in October last I shot a Grey Phalarope (*Phalaropus lobatus*) on the marshes near St. Leonard's, and two more were shot in the same vicinity. From other places in the neighbourhood many more were recorded, and at the same time a Red-necked Phalarope (*P. hyperboreus*) was killed. In the last week of October a Montagu's Harrier (*Circus cinereus*) was shot on the marshes to the east of Hastings and sent over to a local taxidermist for preservation, who also had a fine Fulmar Petrel (*Procellaria glacialis*), found a year ago in an exhausted state on the marshes near Rye.—F. V. THEOBALD (St. Leonard's-on-Sea).

**Snow Bunting on Ben Nevis in Summer.**—During a short tour in Scotland last September, while staying at Fort William, we made the ascent to Ben Nevis, and there at the Observatory saw Snow Buntings in their summer residence, and from information heard that they breed there, being seen the whole spring and summer.—E. C. MOOR (Great Bealings, Woodbridge, Suffolk). [See a note on the Snow Bunting breeding in Scotland, Zool. 1886, p. 336.—ED.]

**Nesting of the Sedge Warbler.**—Last summer I took two nests of this species, differing considerably in their construction from the general fashion, and partaking more of the character of the Reed Warbler than that of the Sedge Warbler; both are lined with hair, in one some feathers are interwoven with the lining. The bottom of both nests was placed at least twelve inches from the ground, in reeds and sedge by the side of the Norwich River, near Hardley Cross, and in both reeds pass through the fabric of the nests, though they are not so actually dependent from the reeds, as is the case, so far as my experience goes, with the Reed Warbler. I was, however, so much struck with the peculiar construction of these nests, that I captured the two birds belonging to one of them; they proved to be Sedge Warblers.—G. SMITH (Great Yarmouth.)

**Immigration of Fieldfares.**—On November 8th we were visited by numerous flocks of Fieldfares, all flying in the same direction, from east to west, the flights continuous and following each other at short intervals. They did not deviate from their course in the least, but each flock followed in the direction of the one before it. They flew low, just topping the hedges and woods; a few struck against the telegraph wires on our railway; five were picked up and brought to me in the evening. I observed a similar occurrence, in vastly superior numbers, in the autumn of 1878, just previous to the two following severe winters, since which time Fieldfares about here have been scarce.—WALTER PRENTIS (Rainham).



**Distribution of the White-bellied Brent Goose.**—So far as I know, little or no attention has hitherto been paid to the distribution of the White-bellied Brent Goose during its stay with us; the only locality named for its occurrence in the 4th edition of Yarrell's 'British Birds' being the Lincolnshire sea-board. As winter is come it would be well if ornithologists would look out for, and record, the occurrence of this very marked race of goose. To set the ball rolling, let me say that a young White-bellied Brent Goose was shot on Loch Pooltiel, Isle of Skye, on October 28th, 1886.—H. A. MACPHERSON (3, Kensington Gardens Sq., W.).

## MOLLUSCA.

**Habits of *Testacella haliotidea*.**—Between four and five months ago I found eleven specimens of this slug upon a low wall surrounding the garden of a house near the Oxford University Parks, and on the following day I captured eleven more in the same place. There had been exceptionally heavy rain, extending over some days, immediately previous to those on which I found the specimens, and it therefore seems probable that these animals are driven out of the earth when it becomes sodden with moisture. Thus it is possible to account for the capture of a very unusual number of specimens, for, as far as I can learn, the species has hitherto only been met with singly in this locality. I have also ascertained what happens to the animals when the earth in which they are contained becomes hard and dry from loss of water. A few of the twenty-two specimens were killed and hardened, and the remainder were put in a box containing earth, in which they buried themselves. In the press of other work the box was neglected, and remained untouched in my laboratory until to-day, the earth having quickly dried into a hard cake. To-day I emptied the box, and fully expected to find the slugs dried up dead, but to my surprise I found twelve specimens alive, each encysted in a thin transparent capsule formed of the hardened mucous secretion of the animal's skin. The body was contracted, and oval in shape, but it had been so completely protected from evaporation that there was no noticeable reduction in bulk after these hottest months of the year, during which water had been entirely withheld. One or two specimens had died almost immediately after capture, and a few escaped, so that all those which had been exposed to the heat and dryness in the box had become encysted, and survived in apparent health.—EDWARD B. POULTON (Wykeham House, Oxford) in 'Nature.'

A CORRECTION.—Kindly spare me space to observe that A. H. Macpherson and H. A. Macpherson have separate existences. Owing to the unlucky similarity of initials, several notes of my cousin, A. H. Macpherson, of Oxford, have been attributed to me in the Index of the volume for 1886; and various friends have also identified our unfortunate individualities as one and the same.—H. A. MACPHERSON (3, Kensington Gardens Square).

## SCIENTIFIC SOCIETIES.

## LINNEAN SOCIETY OF LONDON.

November 18, 1886.—WILLIAM CARRUTHERS, F.R.S., President, in the chair.

Mr. Henry Bury was elected a Fellow of the Society.

Mr. A. D. Michael exhibited living specimens and preparations of an *Argas*, received from Mrs. Crawford, the State Entomologist of Adelaide, Australia. These appear to be identical with the much-dreaded *Argas persicus*, Fischer, the bite of which is supposed to cause madness and death.

The fifth and concluding part of the Rev. A. E. Eaton's Monograph of the Recent Ephemeridæ, or Mayflies, was read in abstract. He states that in his entire memoir 55 genera and 270 species have been characterized, in addition to eleven nameless nymphs and nineteen species named by other authors, which cannot now be classified exactly. Amongst them five genera and sixty-eight species may be reckoned new to Science, and thirteen of the older species have had to be renamed. The author gives a revised summary of the groups, series, sections, and genera, a full description of the figures in the plates, and complete index to the species, and a contents generally of the volume.

Besides the foregoing zoological contributions a number of interesting exhibitions and papers of a botanical character were brought forward and discussed.

December 2, 1886.—WILLIAM CARRUTHERS, F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society, viz.:—Dr. Robert von Lendenfeld, Messrs. J. W. Willis Bund, Arthur Dendy, Anthony Gepp, Kutaro Ito, F. Krause, Francis Molesworth Lascelles, Frederick Sander, John Samson, Harry Sanford Burton, Arthur Warwick Sutton, and Charles W. Wilson. Mr. George Sim was elected an Associate.

Dr. Day read a paper on the Lochleven Trout, which is the form that has been utilized by Sir James Maitland at Howietown, where the elevation is similar to that of their original home from which it is about twenty-five miles distant. These fish are known by their numerous cæcal appendages, and up to their fourth or fifth year they are of a silvery grey with black, but no red spots; subsequently they become of a golden purple, with numerous black and red spots. Undergrown ones take on the colour of the Burn-Trout. Remove these fish to a new locality, and they assume

the form and colour of *Salmo fario*. In 1883 a Salmon-parr and Lochleven Trout were crossed, and the young assumed the red adipose dorsal fin and white-edged margins to the dorsal and ventral, also the orange edges to both sides of the caudal—all colours found in the brook-trout, but not in the Salmon or Lochleven Trout. The statements that the maxilla in this form does not extend behind the eye, that there is no knob on the lower jaw in old males, and that the fins differ from those of *Salmo fario* were shown to be erroneous.

A communication "On a new Species of *Brachyonychus* from the Mergui Archipelago," by Mr. H. W. Bates, was read by the Secretary. The beetle in question is said to be intermediate between *B. lævipennis* and *B. sub-lævis*, both known only from Siam and Cochin China.

December 16.—WILLIAM CARRUTHERS, F.R.S., President, in the chair.

H.R.H. the Prince of Wales was elected an Honorary Member of the Society.

Messrs. Arthur Bawtree, Frederick Justen, Trailskya N. Mukharji (of Calcutta), Francis W. Oliver, and Richard V. Sherring were elected Fellows, and Mr. George Nicholson an Associate of the Society.

The President announced that Sir George MacLeay, K.C.M.G., F.L.S., had presented to the Society a framed water-colour portrait of the Rev. William Kirby, F.L.S., the distinguished Entomologist; and the MSS. and Correspondence of his Father, Alexander MacLeay (elected F.L.S. 1794), formerly Secretary of the Society. For these valuable donations a special vote of thanks was unanimously accorded by the Fellows present.

Mr. Edward A. Heath exhibited a Storm Petrel, *Procellaria pelagica*, which was picked up alive in Kensington Gardens on December 9th. It had doubtless been driven inland by the great storm of the preceding day.

"Experiments on the Sense of Smell in Dogs" was the title of a paper read by Dr. George J. Romanes. After preliminary observations on the faculties of special sense generally, and particularly that of smell as developed in Carnivora and Ruminants, the author detailed the results of some experiments which he had made with a Setter.—J. MURIE.

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#### ZOOLOGICAL SOCIETY OF LONDON.

November 16, 1886.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the months of June, July, August, September, and October, 1886, and called attention to certain interesting accessions which had been received during that period. Amongst these were specially noted a specimen of the Glaucous Macaw, *Ara glauca*, purchased June 3rd;

two young Teheli Monkeys, *Macacus tcheliensis*, from the mountains north of Pekin, presented by Dr. S. W. Bushell; and other animals.

An extract was read from a letter addressed to the President by Dr. Emin Bey, dated Wadilai, Eastern Equatorial Africa, January 1st, 1886, and containing some notes on the distribution of the Anthropoid Apes in Eastern Africa.

A letter was read, addressed to the Secretary by Dr. Chr. Lütken, of Copenhagen, containing some information as to the locality of *Chiropodomys penicillatus*.

A letter was read from Dr. A. B. Meyer, communicating some remarks by Mr. K. G. Henke on a specimen of a hybrid Grouse in the Dresden Museum.

Prof. Flower exhibited and made remarks on a specimen of a rare Armadillo, *Tatusia pilosa*, belonging to the Scarborough Museum.

Prof. Bell exhibited and made remarks on an object (apparently of the nature of an amulet) made from a portion of the skin of some Mammal, and received from Moreton Bay, Australia.

Mr. H. Seebohm exhibited a skin of what he considered to be a young individual of the Lesser White-fronted Goose, *Anser albifrons minutus*, shot in September last on Holy Island, off the coast of Northumberland, and observed that it was the first recorded example of the small form of the White-fronted Goose which had been obtained on the coasts of our islands.

Mr. Blanford exhibited and made some remarks on a mounted specimen of a scarce Paradoxure, *Paradoxurus jerdoni*, from the Neilgherry Hills in Southern India.

A communication was read from Col. Charles Swinhoe, containing an account of the species of lepidopterous insects which he had obtained at Mhow, in Central India.

A communication was read from Dr. R. W. Shufeldt, containing an account of the anatomy of *Geococcyx californianus*.

Mr. Lydekker described three crania and other remains of *Scelidotherium*, two of the former being from the Argentine Republic, and the third from Tarapaca, in Chili. One of the crania from the first locality he referred to the typical *S. leptcephalum* of Owen, while the second, which had been described by Sir R. Owen under the same name, he regarded as distinct, and proposed to call *S. bravardi*. The Tarapaca form, which was characterized by the extremely short nasals, was also regarded as indicating a new species, for which the name of *S. chilense* was proposed. The author concluded that there were not sufficient grounds for separating Lund's proposed genus *Platyonyx* from *Scelidotherium*.

Mr. G. A. Boulenger pointed out that two distinct forms of the Batrachian genus *Bombinator* occur in Central Europe, and read notes on their distinctive characters and geographical distribution.



A communication was read from Dr. R. W. Shufeldt, containing a correction, with additional notes, upon the anatomy of the *Trochilidæ*, *Caprimulgidæ*, and *Cypselidæ*.

A communication was read from Dr. R. A. Philippi, containing a preliminary notice of some of the Tortoises and Fishes of the coast of Chili.

Mr. Sclater exhibited the head of, and made remarks upon an apparently undescribed species of Gazelle from Somali-land.

December 7, 1886.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

Prof. Bell exhibited and made remarks on a rare Entozoon, *Tania nana*, from the human subject.

Mr. Tegetmeier exhibited and made remarks on a pair of antlers of an Elk, *Alces machlis*, said to have been recently obtained in the Galtee mountains in Ireland.

Mr. Frank E. Beddard read a paper on the development and structure of the ovum in the Dipnoid fishes. The present communication was a continuation of a research into the structure of the ovary in *Protopterus*. The author, besides being able to give a more complete account of the ovarian ova of *Protopterus*, was able to supplement this account with some further notes respecting the structures observed in the ovary of *Ceratodus*.

Mr. A. Smith Woodward read a paper on the anatomy and systematic position of the Liassic Selachian, *Squaloraja polyspondyla*. After a brief notice of previous researches, the author attempted an almost complete description of the skeletal parts of *Squaloraja*, as revealed by a fine series of fossils in the British Museum. He confirmed Davies's determination of the absence of the cephalic spine in certain individuals (presumably females), and added further evidence of its prehensile character, suggesting also that the various detached examples afforded indications of one or more new species. The author concluded with some general remarks on the affinities of the genus, and proposed to institute a new family, "*Squalorajidæ*," which might be placed near the *Pristiophoridæ* and *Rhinobatidæ*.

Mr. Sclater pointed out the characters of an apparently new Parrot of the genus *Conurus*, from a specimen living in the Society's Gardens. The species was proposed to be called *Conurus rubritorquis*.

Mr. F. Day communicated (on the part of Mr. J. Douglas Ogilby, of the Australian Museum, Sydney) a paper on an undescribed fish of the genus *Pimelopterus* from Port Jackson, New South Wales, proposed to be named *P. meridionalis*.

Mr. G. A. Boulenger read a paper on the South African Tortoises allied to *Testudo geometrica*, and pointed out the characters of three new species of this group, which he proposed to call *Testudo trimeni*, *T. smithii*,

and *T. fiski*. A second paper by Mr. Boulenger contained some criticisms on Prof. W. K. Parker's paper "On the Skull of the Chameleons," read at a previous meeting of the Society.

Mr. Oldfield Thomas read a paper on the Wallaby commonly known as *Lagorchestes fasciatus*, and showed that the dentition of this animal was entirely different in character, not only to that of the typical species of *Lagorchestes*, but even to that of all the other members of the subfamily Macropodinae. He therefore proposed to form a new genus for its reception, to which he gave the name of *Lagostrophus*.

A communication was read from Prof. R. Collett, containing the description of a new Pouched Mouse from Northern Queensland, which he proposed to name *Antechinus thomasi*.—P. L. SCLATER, *Secretary*.

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#### ENTOMOLOGICAL SOCIETY OF LONDON.

December 1, 1886.—ROBERT M'LACHLAN, Esq., F.R.S., President, in the chair.

Mr. W. H. Miskin, of Brisbane, Queensland, Mr. R. E. Salwey, of Folkestone, and Mr. F. W. Biddle, M.A., of Beckenham, were elected Fellows.

Mr. Howard Vaughan exhibited a long series of *Gnophos obscurata*, comprising specimens from various parts of Ireland, North Wales, Yorkshire, Berwick-on-Tweed, the New Forest, Folkestone, Lewes, and the Surrey Hills. The object of the exhibition was to show the variation of the species in connection with the geological formations of the various localities from which the specimens were obtained.

Dr. Sharp showed a series of drawings of New Zealand Coleoptera, by Freiherr von Schlereth, which, though executed in pencil, were remarkable for their delicacy and accuracy.

Mr. R. Adkin exhibited specimens of *Cidaria reticulata*, recently bred by Mr. H. Murray, of Carnforth, from larvæ collected by him near Windermere, on *Impatiens noli-me-tangere*. Mr. Adkin said that as the food-plant was so extremely local, and consequently difficult for Mr. Murray to obtain, he had endeavoured to get the larvæ to feed on some other species of balsam, including the large garden species, usually known as Canadian balsam, but that he had not succeeded in doing so. Mr. E. B. Poulton observed that this statement tended to confirm the remarks he made at a recent meeting of the Society on the subject of the habits of lepidopterous larvæ with reference to their food-plants.

Mr. Billups exhibited a number of living specimens of *Aleurodes vaporariorum* (Westw.), obtained from a greenhouse at Snaresbrook, where they had caused great havoc amongst tomato plants (*Lycopersicum esculentum*). He remarked that the species had been first figured and described

by Prof. Westwood in the 'Gardener's Chronicle,' 1856, and that attention had been recently called to it by Mr. Douglas (Ent. Mo. Mag. for December). Mr. J. Jenner Weir stated that plants in his greenhouse had been attacked by the same species.

Mr. Poulton exhibited the bright green blood of the pupa of *Smerinthus tilia*, which is one of many lepidopterous pupæ possessing in the blood a chlorophyll-like pigment called meta-chlorophyll by Mr. Poulton. The blood of the larva contains the same pigment in a much smaller amount, while in the pupa the additional colouring-matter fixed in the larval hypodermic cells also passes into solution in the blood. By means of a micro-spectroscope Mr. Poulton was able to show the most characteristic absorption-band of the pigment, together with its resemblance to chlorophyll.

Mr. G. T. Porritt exhibited forms of *Cidaria suffumata* from Huddersfield, including one very similar to that taken at Dover by Mr. Sydney Webb (Proc. Ent. Soc. 1886, p. xxv); and one still more extreme, having only the basal mark and the central stripe, with a slight streak at the tip, brown, the remainder of the wings being perfectly white. He also exhibited a series of small bilberry-fed *Hypsipetes elutata* from Huddersfield, showing green, red-brown, and black forms.

Mr. S. Stevens exhibited forms of *Camptogramma bilineata* and *Emmelesia albulata* from the Shetland Isles, and a curious variety of *Chelonia caja* from Norwich.

The Secretary read a letter from the Administrator-General of British Guiana, on the subject of the urticating properties possessed by the larvæ and pupæ of certain species of Lepidoptera collected in Demerara.

Mr. M'Lachlan read "A Note concerning certain Nemopteridæ."

Miss E. A. Ormerod communicated a paper "On the occurrence of the Hessian Fly (*Cecidomyia destructor*) in Great Britain." It appeared from this paper that there could be no longer any doubt as to the occurrence of the insect in this country, specimens obtained in Hertfordshire having been submitted to, and identified by, Prof. Westwood, and by Mr. W. Saunders, of London, Ontario. Prof. Westwood said the specimens agreed exactly with Austrian specimens in his possession, sent to him some years ago by Mons. Léfèvre, who had received them from the late Dr. Hammer-schmidt, of Vienna. A discussion followed the reading of this paper, in which the President, Mr. C. O. Waterhouse, Mr. Theodore Wood, and others, took part.

At the close of the Ordinary Meeting a Special Meeting was held, for the purpose of considering certain proposed alterations in the Bye-Laws. These having been explained to the meeting were, after some discussion, agreed to, and the proceedings terminated.—H. Goss, *Secretary*.

## NOTICES OF NEW BOOKS.

*Letters on Sport in Eastern Bengal.* By FRANK B. SIMSON (Bengal Civil Service Retired). Royal 8vo, pp. 252, with ten illustrations. London: R. H. Porter. 1886.

SINCE the publication of Mr. Sanderson's 'Thirteen Years amongst the Wild Beasts of India' in 1879, no better book on Sport in India has appeared than that now before us. With a longer experience even than that of his predecessor, Mr. Simson is able not only to confirm from personal observation much that was already known concerning the haunts and habits of the animals which usually come under the denomination of "big game," but in many cases to supplement the remarks of previous writers with useful information. His special delight seems to have been the chase of the Wild Boar, on which subject he writes enthusiastically; and it must be confessed that from a sportsman's point of view he has left little to be said by any future votary of this particular branch of sport who may contemplate writing upon it. It is true that his book is addressed rather to sportsmen than to naturalists, but it is equally true that naturalists would know very little about the habits of many wild animals were it not for the published observations of such men as Mr. Simson—men who are constantly exploring fresh tracts of country, primarily in search of sport, but indirectly helping with their carefully kept journals to elucidate and help forward the study of Zoology. To such writers especially do we look for information on the geographical distribution of animals; for they have such excellent opportunities (if they will only take the trouble) to furnish lists of the species met with in the districts explored by them. In this way, and perhaps in this way only, is it likely that we shall be able to solve some of the interesting problems relating to what may be termed the sporadic distribution of certain remarkable species.

There are other points upon which the testimony of such experienced observers as Mr. Simson is valuable; such, for instance, as the length of Tigers and the height of Elephants, questions which are repeatedly cropping up, and to answer



which it is desirable to have some trustworthy statistics. On the subject of Tigers Mr. Simson writes :—

“I have no need to tell you much about the natural history of the Tiger; specimens are to be seen in every menagerie. But as to his size you will have very different accounts. There was an article on this subject, written by my friend Sir Joseph Fayrer, in ‘Nature’ for November, 1878. The statements of many experienced sportsmen were recorded, my own among the number. I say there that no Tiger killed by me measured more than eleven feet from snout to tail when properly measured. I have shot with several of the gentlemen whose notes were recorded by Sir Joseph. A curious thing happened when I was shooting with Mr. C. Shillingford, which I will relate presently. Had that Tiger been measured before he was skinned in my presence, I might have been able to say I had shot a Tiger between eleven and twelve feet long; but though I wounded the animal when alive, I was not present when he was killed. I merely, to my chagrin, was repeatedly shown the skin afterwards. I may remark that the most experienced Tiger-shooter in my own service stated that he did not think he had once killed one more than eleven feet and a few inches long; and I know he killed between four and five hundred Tigers. The conclusion Sir Joseph comes to, after careful comparison of accounts, is that anything over ten feet is very large, but that Tigers may exceed ten feet three inches, and that, in a few rare and exceptional instances, eleven and even twelve feet have been recorded.

“Tigers vary greatly in size and weight; those of the Tippera, Sylhet, and Chittagong Hills are smaller in every way, as far as my experience went, than those which inhabited the churs and riverain lands in the same part of Bengal.”

To judge by the questions which are repeatedly put to us on the subject, there seems to be much difference of opinion as to the height which Elephants attain. On this point Mr. Simson writes as follows :—

“I cannot say much about exact heights. The largest Elephant I ever rode or saw was one called ‘Bruce,’ which belonged to the Government stud at Dacca; it was, I believe, about ten feet high, and had only one tusk, which was magnificent. This animal shook me to pieces; I could not shoot properly off him. Latterly he became so slow as to be almost a nuisance when in line.

“My own female Elephants, the large howdah ones, varied in size, I think, from a little under seven feet to nearly eight at the shoulder; I never recorded the exact size. Mahouts and merchants who sold Elephants

always made them out taller than they actually were ; I went by the rule, ' Twice round an Elephant's fore foot, when standing with it on the ground, is the height of the animal at the shoulder.' Stout, deep-bodied, short-legged, broad-backed Elephants are the ones to choose ; lanky, long-legged, narrow animals are of much less value."

These extracts are not the best which might have been selected to give an idea of the author's style. He is seen at his best when graphically describing in detail the result of an enjoyable day's sport, with all its varied incidents of danger, disappointment, or success. He gives valuable hints throughout to sportsmen who may be keen enough to follow his example, but who lack experience and a knowledge of the country ; while the interspersal of some good anecdotes here and there make this book a most readable one.

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*Catalogue of the Birds of Suffolk: with an Introduction and Remarks on their Distribution.* By CHURCHILL BABINGTON, D.D., F.L.S., &c., Rector of Cockfield, Suffolk. 8vo, pp. 281, with a Map and seven Photographs. London : Van Voorst. 1886.

THIS Catalogue is reprinted from the 'Proceedings of the Suffolk Institute of Archaeology and Natural History,' and was issued to the members in 1884 as far as the end of the Land Birds (p. 110), the remainder being issued in 1886. It forms a welcome addition to the already long list of county avifaunas, and should find a place in every ornithologist's library.

It is of course much easier to criticise a work of this kind than to write it, but we candidly think that Dr. Babington has not hit upon the best mode of presenting his facts. His division of the county into eight Districts formed by the combination of two or more Hundreds, with purely artificial boundaries, and the employment throughout the volume of different type to indicate this division and subdivision, tends rather to perplex the reader than to enlighten him. One has constantly to turn back to the Introduction to ascertain what districts are intended by the numbers which are given under the head of each species, and from the Introduction one must go to the last chapter in the book "on the distribution of the birds of Suffolk" to discover the natural and physical condition of these districts, whether

woodland or marshland, inland or littoral, before one is in a position to estimate the value of the information supplied. This is too troublesome a process to be repeated with equanimity, especially in an age when new books succeed each other in such rapid succession that it is difficult to keep pace with the flow of literature on any given subject.

Dr. Babington's chapter, however, on the distribution of birds in Suffolk will be read both with pleasure and profit, since it conveys a very fair notion of the physical aspect of the county at the present time, and the changes which have been affected by drainage, cultivation of waste land, disafforesting, and re-planting.

"The woods and plantations in the county are almost entirely of modern growth; some timber is also scattered about, but trees of all kinds are diminishing in many parts and perhaps generally; ancient forests such as those at Staverton and Fakenham are very rare, as are also old woods, those for instance near Needham Market.

"Of marsh land there is now for the most part no great quantity, and much fen has entirely disappeared. . . . The fens which once occupied a large district about Mildenhall appear to have been drained in the early years of the present century; the peat remains in a dry form. . . . There are no mountains and no rocks, and even the hills scattered about the county are few and inconsiderable. . . . On the coast there is abundance of sand and shingle, especially on Orford Beach, the acreage of which is probably larger than anything else of the kind on the east coast. . . . Adjoining the sea are considerable estuaries formed by the Stour, the Orwell, and the Deben. . . . There are also large pieces of water of a brackish character, particularly Breydon Water, Lake Lothing, and Thorpe Mere. The large tract of loose blowing sand below which there is chalk at various depths, lying in the north-west part of the county and known as the 'Breck District,' is a peculiar feature, having its characteristic avifauna."

Dr. Babington's sketch of these physical conditions no doubt explains to some extent the distribution of the birds which are to be met with in the county, and accounts for their great variety. He tells us that 247 species may be regarded with reasonable certainty as Suffolk birds, and of these a very large proportion—more than half—are distributed over the whole of the county. It is a little surprising to learn that no ornithologist in Suffolk has detected the presence (even temporarily, as during the period of migration) of the Water Pipit or the White Wagtail, and that

notwithstanding the geographical position of the county, so favourably situated as it is for the visits of feathered stragglers from the Continent, the occurrence of the Great Reed Warbler, Savi's Warbler, and the Ortolan Bunting is considered more or less doubtful.

Dr. Babington's book will doubtless awaken fresh interest in the study of Ornithology in Suffolk, and we may expect to hear of the discovery of these and some other species which hitherto seem to have escaped observation. The enumeration of the local lists of birds which he has consulted, and the public and private collections in the county which he has examined, testify to the care and pains which the author has bestowed upon the preparation of this useful volume.

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*British Birds' Eggs: a Handbook of British Oology.* By A. G. BUTLER, F.L.S., F.Z.S. Parts IV - VI. 8vo, pp. 113 - 219. London: E. W. Janson. 1886.

WORKS designed for publication in parts do not always appear punctually, nor are they, when begun, always completed. Mr. Butler may be congratulated both upon punctuality and completion. We have already noticed the first three parts of his work (Zool. 1886, p. 378); the remaining three are now before us, forming a goodly volume of 220 pages, with thirty-eight coloured plates of eggs. Looking at some of the earlier plates, as they appeared, we felt compelled to express disappointment, as they did not seem to us to be sufficiently accurate in colouring. In the later parts there is a marked improvement in this respect, several of the figures, although chromo-lithographs, being almost as good as if coloured by hand.

Looking at the number of plates (which contain 370 figures) and the price at which the book is published, we do not doubt that there are many who will be glad to possess in a single volume a handy guide such as this to the study of British Oology. It may be added that Mr. Butler gives figures not only of typical specimens of each species, but also of many of the most striking varieties.

